

CLAIMS

What is claimed is:

5 1. A runner for an intake manifold in an internal combustion engine, the runner comprising:

 a) first and second opposed walls and third and fourth opposed walls for conducting air through said runner; and

 b) a tumble valve assembly for creating turbulence in said air being conducted
10 through said runner, said valve assembly having a pivot-shaft pivotably disposed in said third and fourth walls and having a damper attached to said pivot-shaft, said pivot-shaft and damper being disposed adjacent one of said first and second walls, such that all of said conducted air passes between said pivot-shaft and damper and the other of said first and second walls.

15 2. A runner in accordance with Claim 1 wherein said one of said first and second walls adjacent said pivot-shaft is provided with a first transverse recess for receiving said pivot shaft.

20 3. A runner in accordance with Claim 2 wherein said wall having said first recess is provided with a second transverse recess for receiving said damper when said valve is in an open position.

25 4. A runner in accordance with Claim 1 wherein air tumble may be varied by varying a pivot angle of said pivot-shaft.

 5. A runner in accordance with Claim 1 wherein said runner is rectanguloid in cross-sectional shape and said damper is rectanguloid in plan shape.

6. An intake manifold for an internal combustion engine, comprising at least one runner having

first and second opposed walls and third and fourth opposed walls for conducting air through said runner, and

5 a tumble valve assembly for creating turbulence in said air being conducted through said runner, said valve assembly having a pivot-shaft pivotably disposed in said third and fourth walls and having a damper attached to said pivot-shaft, said pivot-shaft and damper being disposed adjacent one of said first and second walls, such that all of said conducted air passes between said pivot-shaft and damper and the other of said
10 first and second walls.

7. An internal combustion engine comprising at least one intake manifold runner, wherein said at least one runner includes

15 first and second opposed walls and third and fourth opposed walls for conducting air through said runner, and

a tumble valve assembly for creating turbulence in said air being conducted through said runner, said valve assembly having a pivot-shaft pivotably disposed in said third and fourth walls and having a damper attached to said pivot-shaft, said pivot-shaft and damper being disposed adjacent one of said first and second walls, such that all of
20 said conducted air passes between said pivot-shaft and damper and the other of said first and second walls.